IN THE CLAIMS:

1. (Currently Amended)   A method for initiating a peer-to-peer communication session, the method comprising:

initiating a boot process;

initializing a cluster connection manager early in the booting process;

~~attempting~~ initiating, initiating by the cluster connection manager, a first remote direct memory access (RDMA) read operation directed to a cluster partner ~~having an operating system~~ before a storage operating system executing on the cluster partner is fully active, the RDMA read operation bypassing the operating system;

performing, in response to a successful first RDMA read operation, a first RDMA write operation to the cluster partner;

performing, in response to a successful RDMA write operation, a second RDMA read operation directed to the cluster partner; and

performing, in response to a successful second RDMA read operation, a second RDMA write operation to the cluster partner earlier in the booting process.

2. (Original)   The method of claim 1 wherein the step of attempting a first RDMA read operation further comprises the step of issuing a RDMA read operation to the cluster partner requesting a pre-set memory address location that is associated with a status variable on the cluster partner.

3. (Previously Presented)   The method of claim 1 further comprising :

exchanging a set of peer connection information;

passing a set of client information to the cluster partner;

creating a set of appropriate communication ports;

alerting the cluster partner of a ready status; and

alerting a set of clients that the cluster partner is in a ready state.

1   4. (Original)   The method of claim 3 wherein the set of peer connection information

2   comprises a version number.

1   5. (Previously Presented)   The method of claim 1 wherein the step of passing a set of

2   client information to the cluster partner further comprises :

3   collecting, from a set of clients, the set of client information; and

4   transferring the collected set of client information to the cluster partner.

1   6. (Original)   The method of claim 5 wherein the client information comprises a number

2   of communication ports required.

1   7. (Original)   The method of claim 5 wherein the set of client information further com-

2   prises an amount of memory requested by a particular client.

1   8. (Original)   The method of claim 1 wherein the cluster partner is a storage system.

1   9. (Original)   The method of claim 1 wherein the cluster partner is an application server.

1   10.-12. (Cancelled)

1   13. (Currently Amended)   A method for initiating a peer-to-peer communication ses-

2   sion, the method comprising :

3   initiating a booting process;

4   initializing a cluster connection manager early in the booting process;

5   performing, by a cluster connection manager, a first remote direct memory access

6   (RDMA) read operation directed to a cluster partner before a storage operating system

7   executing on the cluster partner is fully active~~having an operating system~~, the RDMA

8   read operation bypassing the operating system; and

3

9   performing, in response to a successful first remote direct memory access read

10 operation, a first remote direct memory access write operation to the cluster partner ear-

11 lier in the booting process.

1   14. (Original) The method of claim 13 wherein the first remote direct memory access

2   read operation is performed over a Virtual Interface connection having a pre-determined

3   and pre-assigned Virtual Interface Number and a pre-determined Fibre Channel ID.

1   15. (Currently Amended)   A method comprising :

2   initiating a boot process;

3   initializing a cluster connection manager early in the boot process;

4   (a)initiating, early in the booting process, a peer-to-peer communication session,

5   by a cluster connection manager, before a storage operating system executing on the clus-

6   ter partner is fully active which bypasses an operating system on a storage system by at-

7   tempting a first remote direct memory access read operation directed to a predefined

8   hardware address and a predefined port number, the predefined hardware address and the

9   predefined port number previously known to support a RDMA operation; and

10   (b)performing early in the booting process, in response to a successful step

11 (a),initiating, a first remote direct memory access write operation directed to the prede-

12 fined hardware address and the predefined port number.

1   16. (Currently Amended)   The method of claim 15 further comprising:

2   (c)performing, in response to a successful step (b)first remote direct memory ac-

3   cess write, a second remote direct memory access read operation directed to the prede-

4   fined hardware address and the predefined port number.

1   17. (Original) The method of claim 15 wherein the predefined hardware address com-

2   prises a fibre channel identifier.

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1　18. (Original) The method of claim 15 wherein the predefined port number comprises a
2　virtual interface.

1　19. (Original) The method of claim 15 wherein the first remote direct memory access is
2　delivered to a predefined memory address storing booting status information.

1　20. (Currently Amended)   A system configured to establish reliable peer-to-peer
2　communication among storage systems of a clustered environment, the system compris-
3　ing:
4　　　　　　a booting process executed by a processor;
5　　　　　　a peer process executing on each storage system partner having an operating sys-
6　tem; and
7　　　　　　a cluster connection manager executing on each storage system partner, the clus-
8　ter connection manager establishing a reliable peer-to-peer connection between each peer
9　process early in the booting process before a storage operating system executing on a
10　cluster partner is fully active by connecting to a predetermined port number using a pre-
11　determined network address, the reliable peer-to-peer connection bypassing the operating
12　system.

1　21. (Original) The system of claim 20 wherein the reliable peer-to-peer connection is
2　established without requiring a storage operating system executing on each storage sys-
3　tem partner to be fully functioning.

1　22. (Original) The system of claim 20 wherein the peer-to-peer connection is a virtual
2　interface connection.

1　23. (Original) The system of claim 20 wherein the peer process is a cluster connection
2　client that requests services from the cluster connection manager.

1   24. (Currently Amended)   A system configured to open an initial peer-to-peer connec-

2   tion over a cluster interconnect, the system comprising:

3   a storage system having an operating system;

4   a booting process executed by a processor;

5   a cluster connection manager executing on the storage system, the cluster connec-

6   tion manager configured to establish a peer connection early in the booting process be-

7   fore a storage operating system executing on a cluster partner is fully active on a prede-

8   termined port number and using a predetermined network address within the storage sys-

9   tem the peer-to-peer connection bypassing the operating system; and

10   a process executing on the storage system, the process configured to use the estab-

11   lished peer connection for communication.

1   25. (Previously Presented)   The system of claim 24 wherein the peer-to-peer connec-

2   tion is a virtual interface connection.

1   26. (Previously Presented)   The system of claim 24 wherein the process executing on

2   the storage system is a cluster connection client that requests services from the cluster

3   connection manager.

1   27. (Previously Presented)   The system of claim 24 wherein the process executing on

2   the storage system communicates with a cluster partner using the established peer con-

3   nection.

1   28. (Currently Amended)   A system configured to accept the initiation of a peer-to-

2   peer connection over a cluster interconnect, the system comprising:

3   a storage system having an operating system;

4   a booting process executed by a processor;

5   a cluster connection manager executing on the storage system, the cluster connection

6   manager configured to accept a peer connection on a predetermined port number and us-

7   ing a predetermined network address within the storage system early in the booting proc-

8   ess before a storage operating system executing is fully active ~~the peer-to-peer connection~~

9   ~~bypassing the operating system~~; and

10   a process executing on the storage system, the process configured to read infor-

11   mation from the established peer connection.

1   29. (Previously Presented)   The system of claim 28 wherein the peer-to-peer connec-

2   tion is a virtual interface connection.

1   30. (Previously Presented)   The system of claim 28 wherein the process executing on

2   the storage system is a cluster connection client that requests services from the cluster

3   connection manager.

1   31. (Previously Presented)   The system of claim 28 wherein the process executing on

2   the storage system reads information from a cluster partner.

1   32. (Previously Presented)   The system of claim 28 wherein the information comprises

2   heartbeat signals.

1   33. (Currently Amended) A method comprising:

2   initiating a boot process;

3   initializing a cluster connection manager early in the boot process;

4   initializing, early in the booting process, a first remote direct memory access

5   (RDMA) read operation that bypasses the ~~operation~~ operating system and is directed to a

6   specific cluster partner ~~before~~ before a storage operating system executing on a cluster

7   partner is fully active ~~a higher virtual interface layer has fully initialize~~d, using a specific

8   port number and a specific address that support a RDMA operations; and

7

9 performing a second RDMA read operation directed to a specific cluster partner

10 before a higher virtual interface layer has fully initialized, using a specific port number

11 and a specific address that support a RDMA operations.

1 34. (Currently Amended) A system configured to accept the initiation of a peer-to-peer

2 connection over a cluster interconnect, the system comprising:

3   a storage system having an operating system;

4   a booting process executing on the storage system;

5   a cluster connection manager executing on the storage system, the cluster connec-

6 tion manager configured to initialize a first remote direct memory access (RDMA) read

7 operation that bypasses the operation system and is directed to a specific cluster partner

8 early in the booting process before a storage operating system executing on a cluster part-

9 ner is fully active before a higher virtual interface layer has fully initialized and use a

10 specific port number and a specific address that support RDMA operations; and

11   a process executing on the storage system, the process configured to use the estab-

12 lished peer-to-peer connection for communication.

1 35. (Currently Amended) A computer readable medium containing executable program

2 instructions executed by a processor, comprising A computer readable medium for accept-

3 ing the initiation of a peer-to-peer connection over a cluster interconnect, the computer

4 readable medium including program instructions when executed adapted to:

5   program instructions that initiate a booting process;

6   program instructions that initialize a cluster connection manager early in the boot-

7 ing process;

8   program instructions that attempting initiate, early in the booting process, a first

9 remote direct memory access (RDMA) read operation before a storage operating system

10 executing on a cluster partner is fully active that bypasses the operation system and is di-

11 rected to a cluster partner;

12   program instructions that perform~~performing~~, in response to a successful first

13   RDMA read operation, a first RDMA write operation to the cluster partner;

14   program instructions that perform~~performing~~, in response to a successful RDMA

15   write operation, a second RDMA read operation directed to the cluster partner; and

16   program instructions that perform early in the booting process~~performing~~, in re-

17   sponse to a successful second RDMA read operation, a second RDMA write operation to

18   the cluster partner.